

Claims

1. A device for object recognition for an automotive safety device with
5 a signal source (10), adapted to generate at least one electromagnetic wave (12), and a receiver (14) for the at least one electromagnetic wave (18) reflected by an obstacle (16),
10 characterized in that an evaluation unit is provided to evaluate the polarization of the at least one electromagnetic wave (18) reflected by the obstacle (16) and received by the receiver (14) and to generate at least one
15 evaluation signal (22).
2. A device according to claim 1,
characterized in that
20 the evaluation unit (20) is adapted to determine the rotation angle of the polarization between the at least one electromagnetic wave (18), reflected by the obstacle (16) and received by the receiver (14) and emitted.
- 25 3. A device according to claim 1 or 2,
characterized in that
the evaluation unit (20) is adapted to determine the
30 type of polarization of the at least one electromagnetic wave (18) reflected by the obstacle (16) and received by the receiver (14).
4. A device according to claim 1, 2 or 3,
characterized in that
35 the evaluation unit (20) is adapted to determine the wavelength of the at least one electromagnetic wave (18) reflected by the obstacle (16) and received by the receiver (14).

the receiver (14).

5. A device according to one of claims 1 to 4,
characterized in that
5 the signal source (10) is adapted to change the
polarization, in particular the angle of polarization,
the level of polarization and/or the type of
polarization of the generated at least one
10 electromagnetic wave (12), in particular to generate
at least two differently polarized electromagnetic
waves (12).
6. A device according to one of claims 1 to 5,
15 characterized in that
the signal source (10) is adapted to change the
wavelength of the generated at least one
electromagnetic wave (12), in particular to generate
at least two electromagnetic waves (12) with different
20 wavelengths.
7. A device according to one of the preceding claims,
characterized in that
25 the evaluation unit (20) is adapted to determine on
the basis of the evaluated polarization, in particular
of the angle of polarization, the level of
polarization and/or the type of polarization and/or
wavelength a surface structure of the obstacle, in
30 particular to evaluate the properties of polarization
of at least two electromagnetic waves with different
wavelengths, preferably to evaluate their ratio.
8. A device according to claim 7,
35 characterized in that
the evaluation unit (20) is adapted to generate as an
evaluation signal (22) an information signal for
influencing and/or controlling the automotive

passenger protection system (24, 26, 28, 30) on the basis of the information on the determined surface structure.

- 5 9. A device according to claim 8,
characterized in that
a control unit (24) of the passenger protection system
comprises a comparison unit (25), which compares the
10 evaluation signal (22) with a threshold value (27),
the control unit (24) being adapted to trigger at
least one safety device (26, 28, 30) when the signal
(22) exceeds the threshold value (27).
- 15 10. A device according to claim 8 or 9,
characterized in that
a control unit (24) of the passenger protection system
is adapted to change dependent on the evaluation
signal (22) a threshold value (27) for activating a
20 security device (26, 28).
11. A device according to claim 9 or 10,
characterized in that
25 the device is used in a pre-crash-system, a cV-system,
an ADC-system a warning system for obstacle and/or
slippery ice and/or a recognition system for roadway
conditions.
- 30 12. A device according to one of the preceding claims,
characterized in that
a receiver (14) is adapted to change its receiving
characteristics controlled by the evaluation unit
(20).
- 35 13. A device according to one of the preceding claims,
characterized in that
the signal source (10) is adapted to generate at least

one linear, circular and/or elliptically polarized electromagnetic wave, in particular with a wavelength in the region of visible light.

5 14.A method for object recognition for an automotive passenger protection system, in which
at least one electromagnetic wave (12) is generated and emitted, and the at least one electromagnetic wave
10 (18) reflected by an obstacle (16) is received, characterized in that
the polarization of the at least one electromagnetic wave (18), reflected by the obstacle (16) and received, is evaluated and at least one evaluation
15 signal is generated.

15.A method according to claim 14,
characterized in that
20 the rotation angle of the polarization between the at least one electromagnetic wave (18), reflected by the obstacle (16) and received and emitted, is determined.

16.A method according to claim 14 or 15,
characterized in that
25 the type of polarization of the at least one electromagnetic wave (18), reflected by the obstacle (16) and received, is determined.

30 17.A method according to claim 14, 15 or 16, characterized in that
the wavelength of the at least one electromagnetic wave (18), reflected by the obstacle (16) and received, is determined.

35 18.A method according to one of claims 14 to 17, characterized in that
the polarization, in particular the angle of

polarization, the level of polarization and/or the type of polarization of the generated at least one electromagnetic wave (12) is changed, in particular that two or more electromagnetic waves (12) with different polarizations are emitted.

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19. A method according to one of claims 14 to 18, characterized in that

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the wavelength of the generated at least one electromagnetic wave (12) is changed, in particular two or more electromagnetic waves (12) with different wavelengths are emitted.

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20. A method according to one of claims 14 to 19, characterized in that

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on the basis of the evaluated polarization, in particular of the angle of polarization, the level of polarization and/or the type of polarization and/or wavelength a surface structure of the obstacle is determined.

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21. A method according to claim 20, characterized in that

on the basis of the information on the determined surface structure the automotive passenger protection system (24, 26, 28, 30) is controlled.

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22. A method according to one of claims 14 to 21, characterized in that

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the emitting characteristics when emitting and/or the receiving characteristics when receiving the at least one electromagnetic wave (18) reflected by the obstacle (16) is changed.

23. A method according to one of claims 14 to 22, characterized in that

at least one linear, circular and/or elliptically polarized electromagnetic wave, in particular with a wavelength in the region of visible light, is generated.

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24. A method according to one of claims 14 to 23, characterized in that

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a non-polarized electromagnetic wave is emitted and its reflection at the obstacle is analyzed with regard to the properties of polarization, in particular in terms of the polarization portions and directions contained in the reflected wave, and to compare the information thus obtained with the stored information on polarizations of reflected waves at certain materials such as concrete, wood, metal, cardboard or the like.

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